Air Quality Permit

Issued to: United States Department of Health and Human Services
National Institutes of Health
Rocky Mountain Laboratories
903 South 4th Street
Hamilton, MT 59840

Permit #2991-04
Permit Application Complete: 02/06/03
Preliminary Determination Issued: 03/06/03
Department Decision Issued: 03/24/03
Permit Final: 04/09/03
AFS #081-0005

An air quality permit, with conditions, is hereby granted to the U.S. Department of Health and Human Services, National Institutes of Health, Rocky Mountain Laboratories (RML), pursuant to Sections 75-2-204, 211, and 215, Montana Code Annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.701, *et seq*., as amended, for the following:

SECTION I: Permitted Facility

A. Permitted Facility

RML operates a biomedical research facility located at 903 South 4th Street in Hamilton, Montana. The legal description of the facility is the NE¼ of Section 36, Township 6 North, Range 21 West, Ravalli County, Montana. A complete listing of the equipment at the facility is contained in the permit analysis.

B. Current Permit Action

On February 6, 2003, the Montana Department of Environmental Quality (Department) received a complete permit application from RML for proposed changes to the existing permitted facility. Specifically, the current permit action adds one 64.5 MMBtu/hr natural gas fired boiler; two emergency/back-up status power generators (1250 kW and 2000 kW, respectively), one 10,000-gallon above ground fuel storage tank (FST) for number-2 fuel oil; and various additional laboratory fume hoods.

Further, in accordance with 40 Code of Federal Regulations (CFR) Part 60, Subpart Ce, RML submitted a permit application for a major source Title V operating permit concurrently with the current permit action.

SECTION II: Limitations and Conditions

A. Operational Requirements

1. RML shall not incinerate any material other than pathological waste, hospital/medical/infectious waste (HMIW) (as defined under 40 CFR 60, Subpart Ce), radioactive waste per Nuclear Regulatory Commission license, or general refuse from the facility (ARM 17.8.710).

2. RML shall not incinerate more than 3504 tons of pathological waste or general refuse, combined, during any rolling 12-month time period (ARM 17.8.710).

3. RML shall comply with all applicable standards, limitations, and the reporting, record keeping, and notification requirements contained in 40 CFR Part 60, Subpart Ce, as it applies to the incinerators at this facility (ARM 17.8.340 and 40 CFR 60).

4. RML shall not operate both Consumat incinerators simultaneously (ARM 17.8.710).

5. Each Consumat incinerator shall be limited to a maximum charge rate equal to or less than 500 pounds per hour (lb/hr) (ARM 17.8.710).

6. Natural gas consumption at the RML facility shall be limited to 847 million cubic feet during any rolling 12-month time period (ARM 17.8.710).

7. Number 2 fuel-oil may be used only as a back-up fuel at RML's facility, provided that the oil does not contain greater than 0.5 weight-percent sulfur (ARM 17.8.710).

8. The emergency generators at the RML facility shall be used only as backup sources of power and not as part of normal operations. Each generator shall be limited to 500 hours of operation during any rolling 12-month time period (ARM 17.8.710).

9. RML shall comply with all applicable standards, limitations, and the reporting, record keeping, and notification requirements contained in 40 CFR Part 60, Subpart Dc, as it applies to the two 66 MMBtu/hr natural gas-fired boilers and the 64.5 MMBtu/hr natural gas-fired boiler at the RML facility (ARM 17.8.340 and 40 CFR 60).

B. Emission Limitations

1. RML shall not cause or authorize to be discharged into the atmosphere from the incinerators:

   a. Any visible emissions that exhibit an opacity of 10% or greater averaged over 6 consecutive minutes (ARM 17.8.316, ARM 17.8.340, and 40 CFR 60, Subpart Ce).

   b. Any particulate matter (PM) emissions in excess of 0.03 grains per dry standard cubic feet (gr/dscf) (40 CFR 60, ARM 17.8.340, Subpart Ce).

   c. Any carbon monoxide (CO) emissions that exceed 40 parts per million (ppm) (ARM 17.8.340 and 40 CFR 60, Subpart Ce).

   d. Any dioxins/furans that exceed 55 gr/billion dscf (ARM 17.8.340 and 40 CFR 60, Subpart Ce).

   e. Any hydrogen chloride (HCl) emissions that exceed 100 ppm by volume or 93% reduction (ARM 17.8.340 and 40 CFR 60, Subpart Ce).

   f. Any sulfur dioxide (SO_2) emissions that exceed 55 ppm by volume (ARM 17.8.340 and 40 CFR 60, Subpart Ce).

g. Any nitrogen oxide (NO_x) emissions that exceed 250 ppm by volume (ARM 17.8.340 and 40 CFR 60, Subpart Ce).

h. Any lead (Pb) emissions that exceed 0.52 gr/thousand dscf or 70% reduction (ARM 17.8.340 and 40 CFR 60, Subpart Ce).

i. Any cadmium (Cd) emissions that exceed 0.07 gr/thousand dscf or 65% reduction (ARM 17.8.340 and 40 CFR 60, Subpart Ce).

j. Any mercury (Hg) emissions that exceed 0.24 gr/thousand dscf or 85% reduction (ARM 17.8.340 and 40 CFR 60, Subpart Ce).

- All emission limits contained in Section II.B.1.(b-j) are corrected to 7% O_2 where applicable (ARM 17.8.340 and 40 CFR 60, Subpart Ce).

2. RML may not cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).

C. Testing Requirements

1. Within 60 days after achieving the maximum production rate, but not later than 180 days after initial start-up of the incinerators, RML shall perform source testing on the incinerators to demonstrate compliance with the emission limits contained in Section II.B.1.(a-j) as specified in 40 CFR Part 60.56(c) (ARM 17.8.340 and 40 CFR Part 60, General Provisions and Subpart Ce).

2. After the initial performance source test(s) required in Section II.C.1, RML shall conduct additional performance source tests as specified in 40 CFR 60.56c, according to the following schedule (40 CFR 60.56.C(c)).

a. RML shall determine compliance with the opacity limitation in Section II.B.1.(a), by conducting an annual source test (no more than 12 months following the previous performance source test).

b. RML shall determine compliance with the PM, CO, and HCl emission limits in Section II.B.1.(b), Section II.B.1.(c), and Section II.B.1.(e), respectively, by conducting an annual performance source test (no more than 12 months following the previous performance source test). If all three performance tests over a 3-year period indicate compliance with the applicable emission limit, RML may forego a performance test for that pollutant for the subsequent 2-year period. At a minimum, a performance test for each pollutant shall be conducted every third year (no more than 36 months following the previous performance source test). If a performance test conducted every third year indicates compliance with the applicable emission limit for a pollutant (PM, CO, HCl), RML may forego a performance test for that pollutant for an additional 2 years. If any performance test indicates non-compliance with the respective emission limit, a performance source test for that pollutant shall be conducted annually until all annual performance source tests conducted over a 3-year period indicate compliance with the emission limit.

3. All compliance source tests shall be conducted in accordance with the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

4. The Department may require further testing (ARM 17.8.105).

D. Monitoring Requirements

RML shall maintain compliance with all monitoring requirements contained in 40 CFR 60.57(c) as applicable.

E. Operational Reporting Requirement

1. RML shall supply the Department with annual production information for all emission points, as required by the Department, in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions covered by this permit.

Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in units as required by the Department.

In addition, RML shall submit the following information annually to the Department by the date required in the emission inventory request. This information is required for the annual emission inventory, as well as to verify compliance with permit conditions (ARM 17.8.505).

a. Estimated amount of material incinerated (lb/yr); and

b. Amount of natural gas consumed at the facility.

2. RML shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.705(1)(r) that would include a change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location, or fuel specifications, or would result in an increase in source capacity above its permitted operation or the addition of a new emissions unit. The notice must be submitted to the Department, in writing, 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.705(1)(r)(iv) (ARM 17.8.705).

3. RML shall document, by month, the amount of pathological waste and general refuse combusted in the incinerators. By the 25th day of each month, RML shall total the amount of waste combusted during the previous 12 months to verify compliance with the limitation in Section II.A.2 (ARM 17.8.710).

4. RML shall maintain an incinerator operations log to demonstrate compliance with the requirement that the incinerators shall not be operated simultaneously as described in Section II.A.4. The log shall include the applicable information, the date, time, and operator's initials (ARM 17.8.710).

5. RML shall document the amount of waste incinerated during each charge for each incinerator to demonstrate compliance with the requirement in Section II.A.5. The log shall include the applicable information, the date, time, and

operator's initials (ARM 17.8.710).

6. RML shall document, by month, the amount of natural gas consumed at the facility. By the 25th day of each month, RML shall total the amount of natural gas combusted during the previous 12 months to verify compliance with the limitation in Section II.A.6 (ARM 17.8.710).

7. RML shall document, by month, the hours of operation for each emergency diesel-fired generator at the facility. By the 25th day of each month, RML shall total the hours of operation for each diesel-fired generator during the previous 12 months to verify compliance with the limitation in Section II.A.8 (ARM 17.8.710).

8. All records compiled in accordance with this permit shall be maintained by RML as a permanent business record for at least 5 years following the date of the measurement, shall be submitted to the Department upon request, and shall be available at the plant site for inspection by the Department (ARM 17.8.710).

F. Malfunctions

The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation, or to continue for a period greater than 4 hours (ARM 17.8.110).

SECTION III: General Conditions

A. Inspection - The recipient shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections, surveys, collecting samples, obtaining data, auditing any monitoring equipment (CEMS, CERMS) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.

B. Waiver - The permit and all the terms, conditions, and matters stated herein shall be deemed accepted if the recipient fails to appeal as indicated below.

C. Compliance with Statutes and Regulations - Nothing in this permit shall be construed as relieving the permittee of the responsibility for complying with any applicable federal or Montana statute, rule or standard, except as specifically provided in ARM 17.8.701, *et. seq.* (ARM 17.8.717).

D. Enforcement - Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement as specified in Section 75-2-401 *et seq*., MCA.

E. Appeals - Any person or persons jointly or severally adversely affected by the Department's decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The Department's decision on the application is not final unless 15 days have elapsed and there is no request for a hearing under this section. The filing of a request for a hearing postpones the effective date of the Department's decision until the conclusion of the hearing and issuance of a final decision by the Board.

F. Permit Inspection - As required by ARM 17.8.716, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by Department personnel at the location of the permitted source.

G. Construction Commencement - Construction must begin within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall be revoked.

H. Permit Fees - Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, the continuing validity of this permit is conditional upon the payment by the permittee of an annual operation fee, as required by that section and rules adopted thereunder by the Board.

Permit Analysis
Rocky Mountain Laboratories
Permit #2991-04

I. Introduction

A. Permitted Equipment

The U.S. Department of Health and Human Services, National Institutes of Health, Rocky Mountain Laboratories (RML) operates a biomedical research facility located at 903 South 4th Street in Hamilton, Montana. The legal description of the facility is the NE¼ of Section 36, Township 6 North, Range 21 West, Ravalli County, Montana. The research facility consists of the following sources of emissions:

1. Boiler #1 is a 20-MMBtu/hr natural gas-fired boiler that was manufactured in 1965.

2. Boiler #2 is a 14.7-MMBtu/hr natural gas-fired boiler that was manufactured in 1969.

3. Boiler #3 is a 14.7-MMBtu/hr natural gas-fired boiler that was manufactured in 1976.

4. Boiler #4 is a 66-MMBtu/hr natural gas-fired boiler (with No. 2 fuel oil as back up) that was manufactured in 1999.

5. Boiler #5 is a 66-MMBtu/hr natural gas-fired boiler (with No. 2 fuel oil as back up) that was manufactured in 1999.

6. Boiler #6 is a 64.5-MMBtu/hr natural gas-fired boiler with No. 2 fuel oil as back up.

7. The Consumat Model C-325PA Pathological Furnace is a 6.5-MMBtu/hr natural gas-fired incinerator, which is limited by permit to a maximum charge rate equal to or less than 500 lb/hr. This incinerator was manufactured in 1985 and is controlled by a wet scrubber.

8. The Consumat Model C-225P Pathological Furnace is a 3.5-MMBtu/hr natural gas-fired incinerator, which is limited by permit to a maximum charge rate equal to or less than 500 lb/hr. This incinerator was manufactured in 1985 and is controlled by a wet scrubber.

9. Miscellaneous diesel-fired emergency generators including one 300-kW generator, one 400-kW generator, one 600-kW generator, two 1250-kW generators, one 1500-kW generator, and one 2000 kW generator.

10. Miscellaneous fuel storage tanks including two 300-gallon tanks, one 2500-gallon tank, one 5000-gallon tank, one 8000-gallon tank, one 10,000-gallon tank, and one 20,000-gallon tank.

11. Miscellaneous laboratory fume hoods.

B. Source Description

RML operates a biomedical research facility conducting basic and applied research in immunological, allergic, and infectious diseases for the National Institute of Allergy and Infectious Disease, National Institutes of Health, Department of Health and Human Services.

C. Permit History

In 1985, and then again in 1987, the Department of Environmental Quality (Department) determined that the RML facility did not need to obtain an air quality preconstruction permit prior to installing the above-mentioned emission sources. However, the air quality rules changed and the Department determined that it was no longer permissible for facilities to determine their potential-to-emit using controlled emissions. Therefore, since RML does have potential emissions exceeding 25 tons per year (tpy), RML was required to obtain an air quality preconstruction permit. RML was not required to demonstrate compliance with the additional permitting requirements contained in Montana Code Annotated (MCA) 75-2-215 because their incinerators were existing sources of emissions. Consequently, on October 22, 1997, RML submitted a complete permit application for their facility. Permit **#2991-00** was issued final on January 2, 1998.

On March 17, 2000, RML was issued Permit **#2991-01** to expand the boiler plant at their facility. The expansion involved the installation of two new 66-MMBtu/hr boilers fired primarily on natural gas, with No. 2 fuel oil used as back-up fuel. As part of this project, RML also installed a 300-kW emergency generator fired on diesel fuel and a 20,000-gallon above-ground storage tank. The emissions increase resulting from this boiler plant expansion was greater than 15 tpy; therefore, RML was required to submit an application to alter their air quality permit. However, a limitation on the amount of natural gas consumption was placed on the facility to keep the total emissions below the Title V threshold.

RML also included a de minimis project as part of this permit action. RML proposed to upgrade the wet scrubber controlling the incinerator system. The upgrade ensured that the incinerators would be able to meet the emission limitations contained in the Hospital/Medical/Infectious Waste (HMIW) Incinerator New Source Performance Standards 40 Code of Federal Regulations Part 60 (40 CFR 60), Subpart Ce. These emission standards were not applicable to RML's facility at the time of this permitting action because a limitation on the amount of waste defined as Hospital/Medical/Infectious Waste was placed in the air quality permit. The installation of the wet scrubber did not require a permit because it qualified as a de minimis project, as defined in the Administrative Rules of Montana (ARM) 17.8.705(1)(r). However, the scrubber was listed to avoid future confusion that could result from the installation of the wet scrubber. Permit #2991-01 replaced Permit #2991-00.

RML's air quality Permit #2991-01 limited the amount of HMIW, as defined under 40 CFR 60, Subpart Ce, to an amount less than 10% of the total waste stream incinerated at the facility. The condition was included in the permit for the purpose of allowing RML to operate as a co-fired combustor meeting the definition of an exempt source under 40 CFR 60, Subpart Ce. On February 15, 2002, the Department received a request from RML to review this determination. The request centered on questions regarding the interpretation and definition of HMIW as applicable to RML. Specifically, RML posed the question as to whether or not the disposable plastic lab-ware used at the facility was considered HMIW.

Based on subsequent information submitted by RML, the Department determined that the

plastic lab-ware meets the definition of "…*culture dishes and devices used to transfer, inoculate, and mix cultures*" (40 CFR 60.51(c) *medical/infectious waste*(1)) and is therefore, by this definition, considered HMIW. When plastic lab-ware, as described above, was included with the waste stream as HMIW, RML exceeded the 10% HMIW threshold for the co-combuster exemption and was thus determined to be subject to all applicable requirements of 40 CFR 60, Subpart Ce.

On June 17, 2002, the Department received a request from RML to modify air quality Permit #2991-01 to include all applicable requirements of 40 CFR 60, Subpart Ce. The permit action removed the condition in Section II.A.3 of Permit #2991-01, which limited the allowable amount of HMIW incinerated at the facility. The permit action also incorporated all applicable requirements of 40 CFR 60, Subpart Ce. Further, with the new determination of HMIW applicability and in accordance with 40 CFR 60.32(i), RML was required to obtain and operate pursuant to a Title V operating permit. Permit **#2991-02** was issued final on August 9, 2002, and replaced Permit #2991-01.

On October 1, 2002, the Department received a request from RML to modify air quality Permit #2991-02 to include federally enforceable permit limits for the HMIW incinerators at the facility. The purpose of the proposed limits was to ensure that the incinerators meet the definition of medium HMIW incinerators as defined in 40 CFR 60, Subpart Ce.

In addition, on August 5, 2002, the Department received information from RML regarding equipment changes at the facility. The equipment changes included an increase in the number of fume hoods at the facility, the removal of an 18,000-gallon fuel storage tank (FST), the replacement of a 120 gallon FST with a 300 gallon FST, the replacement of a 550 gallon FST with a 300 gallon FST, the addition of an 8000 gallon FST, and the addition of a 1500 kilowatt (kW) emergency generator. After correspondence with RML, the Department determined that because the potential to emit for all previously listed and previously un-permitted equipment is less than 15 tons per year (tpy), the equipment could be added to the list of permitted equipment in accordance with ARM 17.8.705(1)(r). Permit **#2991-03** was issued final on November 8, 2002, and replaced Permit #2991-02.

D. Current Permit Action

On February 6, 2003, the Department received a complete permit application from RML for proposed changes to the existing permitted facility. Specifically, the permit application indicated that RML would be removing three natural gas fired boilers of 20 million British thermal unit per hour (MMBtu/hr) heat input capacity, 14.7 MMBtu/hr capacity, and 14.7 MMBtu/hr capacity, respectively; removing 2 existing and permitted emergency/back-up status generators of 400 kilowatts (kW) and 600 kW, respectively; and removing one 2500-gallon above ground number 2 fuel-oil FST. In addition, the application indicated the RML would be adding one 64.5 MMBtu/hr natural gas fired boiler; adding two emergency/back-up status diesel-fired generators of 1250 kW and 2000 kW, respectively; adding one 10,000-gallon number 2 fuel oil FST; and adding various laboratory fume hoods to the permitted facility.

After submittal of the application for the current permit action, including all of the above listed proposed permit changes, RML informed the Department that the previously listed equipment to be removed from the permitted facility would not be removed for a period of time. Therefore, the Department suggested, and RML agreed, that the facility should maintain a permit for this equipment as long as the equipment physically remained on the

site and only remove each respective piece of equipment from the permitted facility when and if RML begins preparations for the physical removal of the equipment from the site. The current permit action includes the equipment listed above as additions to the permitted facility but does not remove any of the above listed equipment at this time.

Further, in accordance with 40 CFR Part 60, Subpart Ce, RML submitted a permit application for a major source Title V operating permit concurrently with the previously discussed application for changes to the existing preconstruction permit. Permit **#2991-04** replaces Permit #2991-03.

E. Additional Information

Additional information, such as applicable rules and regulations, Best Available Control Technology (BACT) determinations, air quality impacts, and environmental assessments, is included in the analysis associated with each change to the permit.

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the ARMs and are available upon request from the Department. Upon request, the Department will provide references for locations of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1, General Provisions, including, but not limited to:

1. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment, including instruments and sensing devices, and shall conduct tests, emission or ambient, for such periods of time as may be necessary, using methods approved by the Department.

2. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq*., Montana Code Annotated (MCA).

   RML shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

3. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation, or to continue for a period greater than 4 hours.

4. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means which, without resulting in reduction in the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant which would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be

operated or maintained in such a manner that a public nuisance is created.

B. ARM 17.8, Subchapter 2, Ambient Air Quality, including, but not limited to:

1. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
2. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
3. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
4. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide
5. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
6. ARM 17.8.223 Ambient Air Quality Standard for PM_{10}

RML must comply with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3, Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

2. ARM 17.8.308 Particulate Matter, Airborne. This rule requires an opacity limitation of 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter.

3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.

4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.

5. ARM 17.8.316 Incinerators. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere, from any incinerator, particulate matter in excess of 0.10 grains per standard cubic foot of dry flue gas, adjusted to 12% carbon dioxide and calculated as if no auxiliary fuel had been used. Further, no person shall cause or authorize to be discharged into the outdoor atmosphere from any incinerator, emissions which exhibit an opacity of 10% or greater averaged over 6 consecutive minutes.

6. ARM 17.8.322 Sulfur Oxide Emissions-Sulfur in Fuel. (5) Commencing July 1, 1971, no person shall burn any gaseous fuel containing sulfur compounds in excess of 50 grains per 100 cubic feet of gaseous fuel, calculated as hydrogen sulfide at standard conditions.

7. ARM 17.8.340 Standards of Performance for New Stationary Sources. This rule incorporates, by reference, 40 CFR 60, Standards of Performance for New Stationary Sources (NSPS). This facility is considered an NSPS affected facility under 40 CFR 60 and is subject to the requirements of the following subparts.

   40 CFR Part 60, Subpart Ce, Standards of Performance for Hospital/Medical/ Infectious Waste Incinerators. Subpart Ce applies to the incinerators at the RML facility.

Prior to issuance of Permit #2991-02, RML was incorrectly considered a co-combuster as defined in Subpart Ce and was therefore exempt from the requirements of this subpart. Under permit action #2991-02, the Department determined that the exemption did not apply to the incinerators at the RML facility. 40 CFR 60, Subpart Ce, was determined to apply to the Consumat incinerators at the facility because these units meet the definition of affected sources.

40 CFR Part 60, Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. Subpart Dc was determined to apply to the two 66-MMBtu/hr natural gas-fired boilers and the 64.5 MMBtu/hr natural gas-fired boiler because these units meet the definition of and affected source and were manufactured after June 9, 1989.

D. ARM 17.8, Subchapter 5, Air Quality Permit Application, Operation and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. RML shall submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. RML submitted the required permit application fee for the current permit action.

2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit, excluding an open burning permit, issued by the Department; and the air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

   The annual assessment and collection of the air quality operation fee, as described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions which pro-rate the required fee amount.

E. ARM 17.8, Subchapter 7, Permit, Construction and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.704 General Procedures for Air Quality Preconstruction Permitting. An air quality preconstruction permit shall contain requirements and conditions applicable to both construction and subsequent use.

2. ARM 17.8.705 When Permit Required--Exclusions. This rule requires a facility to obtain an air quality permit or permit alteration if they construct, alter, or use an air contaminant source that has the potential to emit more than 25 tons per year of any pollutant. RML has the potential to emit more than 25 tons per year of CO and NO_X; therefore, an air quality permit is required.

   Further, in accordance with MCA 75-2-215, the RML facility requires an air quality preconstruction permit because the facility incorporates incinerators.

3. ARM 17.8.706 New or Altered Sources and Stacks, Permit Application Requirements. This rule requires that an application for an air quality permit be submitted for a new or altered source or stack. RML submitted a complete permit application on February 6, 2003, for the current permit action.

4. ARM 17.8.707 Waivers. ARM 17.8.706 requires the permit application be submitted 180 days before construction begins. This rule allows the Department to waive this time limit. The Department hereby waives this limit.

5. ARM 17.8.710 Conditions for Issuance of Permit. This rule requires that the source demonstrate compliance with applicable rules and standards before a permit can be issued. RML demonstrated compliance with applicable rules and standards as required for permit issuance.

6. ARM 17.8.715 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The required BACT analysis and determination is contained in Section III of this permit analysis.

7. ARM 17.8.716 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.

8. ARM 17.8.717 Compliance with Other Statutes and Rules. This rule states that nothing in the permit shall be construed as relieving RML of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.701, *et seq*.

9. ARM 17.8.720 Public Review of Permit Applications. This rule requires that RML notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for permit. RML submitted an affidavit of publication of public notice for the January 27, 2003, issue of the *Ravalli Republic*, a newspaper of general circulation in the Town of Hamilton in Ravalli County, as proof of compliance with the public notice requirements.

10. ARM 17.8.731 Duration of Permit. An air quality permit shall be valid until revoked or modified as provided in this subchapter, except that a permit issued prior to construction of a new or altered source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.

11. ARM 17.8.733 Modification of Permit. An air quality permit may be modified for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. A source may not increase its emissions beyond those found in its permit unless the source applies for and receives another permit.

12. ARM 17.8.734 Transfer of Permit. This rule states that an air quality permit may

be transferred from one person to another if written notice of Intent to Transfer, including the names of the transferor and the transferee, is sent to the Department.

F. ARM 17.8, Subchapter 8, Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the Federal Clean Air Act (FCAA) that it would emit, except as this subchapter would otherwise allow.

   This facility is not a major stationary source since this facility is not a listed source and the facility's potential to emit is less than 250 tons per year of any pollutant (excluding fugitive emissions).

G. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any source having:

   a. Potential to Emit (PTE) > 100 tons/year of any pollutant;

   b. PTE > 10 tons/year of any one Hazardous Air Pollutant (HAP), PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or

   c. PTE > 70 tons/year of PM_{10} in a serious PM_{10} nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing Air Quality Permit #2991-04 for RML, the following conclusions were made.

   a. The facility's PTE is greater than 100 tons/year for NO_x.

   b. The facility's PTE is less than 10 tons/year for and one HAP and less than 25 tons/year for all HAPs.

   c. This source is not located in a serious PM_{10} nonattainment area.

   d. This facility is subject to 40 CFR 60, Subpart Ce, and 40 CFR 60, Subpart Dc.

   e. This facility is not subject to any current NESHAP standards, other than potentially 40 CFR 63, Subpart M, Asbestos.

   f. This source is not a Title IV affected source

g. This source is not an EPA designated Title V source.

In accordance with 40 CFR 60.32e(i), RML is subject to the requirements of the Title V operating permit program and must obtain a Title V permit for operations at the facility. Also, RML is considered a major source under the Title V operating permit program because the facility has the potential to emit greater than 100 tons/year of NO_x.

H. Montana Code Annotated (MCA) 75-2-103, Definitions, provides, in part, as follows:

1. "Incinerator" means any single or multiple-chambered combustion device that burns combustible material, alone or with a supplemental fuel or catalytic combustion assistance, primarily for the purpose of removal, destruction, disposal, or volume reduction of all or any portion of the input material.

2. "Solid waste" means all putrescible and nonputrescible solid, semisolid, liquid, or gaseous wastes including, but not limited to,...air pollution control facilities...

I. MCA 75-2-215, Solid or hazardous waste incineration - additional permit requirements:

1. MCA 75-2-215 requires air quality permits for all new commercial solid waste incinerators.

2. MCA 75-2-215 requires the applicant to provide, to the Department's satisfaction, a characterization and estimate of emissions and ambient concentrations of air pollutants, including HAPs from the incineration of solid waste.

3. MCA 75-2-215 requires the Department reach a determination that the projected emissions and ambient concentrations constitute a negligible risk to public health, safety and welfare.

4. MCA 75-2-215 requires the application of pollution control equipment or procedures that meet or exceed BACT.

The additional permit requirements contained in MCA 75-2-215 do not apply to RML because the incinerators at the facility are existing sources of emissions and have not been altered since the adoption of this legislation.

III. BACT Analysis and Determination

A BACT determination is required for each new or altered source. RML shall install on the new or altered source the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized.

A. Natural Gas Fired Boiler BACT Analysis

1. NO_x BACT Analysis

NO_x emissions are the pollutant of concern when evaluating BACT for natural gas-fired boilers such as that proposed under the current permit action. NO_x formation occurs by three fundamentally different mechanisms. The principal mechanism of NO_x in natural gas combustion is thermal NO_x. The thermal NO_x mechanism occurs through the thermal dissociation and the subsequent reaction of nitrogen (N_2) and oxygen (O_2) molecules in

the combustion air. Most NO_x formed through the thermal NO_x mechanism occurs in the high temperature flame zone near the burners. The formation of thermal NO_x is affected by three furnace zone factors: (1) oxygen concentration, (2) peak temperature, and (3) time of exposure at peak temperature. As these three factors increase, NO_x emission levels increase. The emission trends due to changes in these factors are fairly consistent for all types of natural gas-fired boilers and furnaces. Emission levels vary considerably with the type and size of combustor and with operating conditions (e.g. combustion air temperature, volumetric heat release rate, load, and excess oxygen level).

The second mechanism of NO_x formation, called prompt NO_x, occurs through early reaction of nitrogen molecules in the combustion air and hydrocarbon radicals from the fuel. Prompt NO_x reactions occur within the flame and are usually negligible when compared to the amount of NO_x formed through the thermal NO_x mechanism. However, prompt NO_x levels may become significant with the use of ultra-low-NO_x burners.

The third mechanism of NO_x formation, called fuel NO_x, stems from the evolution and reaction of fuel-bound nitrogen compounds with oxygen. Due to the characteristically low fuel nitrogen content of natural gas, NO_x formation through the fuel NO_x mechanism for boilers fired with natural gas is insignificant.

Currently, the most prevalent combustion control techniques used to reduce NO_x emissions from natural gas-fired boilers are flue gas recirculation (FGR), low NO_x burners, or a combination of the two techniques. The following NO_x BACT analysis discusses the three previously-cited control strategies as well as no additional or no add-on control.

FGR Control

In an FGR system, a portion of the flue gas is re-circulated from the stack to the burner windbox. Upon entering the windbox, the re-circulated gas is mixed with combustion air prior to being fed to the burner. The recycled flue gas consists of combustion products which act as inerts during combustion of the fuel/air mixture. The FGR system reduces NO_x emissions by two mechanisms. Primarily, the re-circulated gas acts as a dilutent to reduce combustion temperatures thus suppressing the thermal NO_x mechanism. To a lesser extent, FGR reduces NO_x formation by lowering the oxygen concentration in the primary flame zone. The amount of re-circulated flue gas is a key operating parameter influencing NO_x emission rates for the FGR system.

Low NO_x Burner Control

Low NO_x burners reduce NO_x by accomplishing the combustion process in stages. Staging partially delays the combustion process, resulting in a cooler flame, which suppresses thermal NO_x formation. The two most common types of low NO_x burners being applied to natural gas boilers are staged air burners and staged fuel burners. Application of low NO_x burner control can reduce NO_x emissions by 40-85 percent.

As part of the current permit application, RML submitted a cost efficiency analysis for the installation of low NO_x burner controls as related to the estimated reduction in NO_x emissions. The estimated NO_x reduction between uncontrolled and low NO_x burner control NO_x emissions is approximately 23.1 tons per year for the proposed boiler. The estimated cost of installation of retrofitted low NO_x burner control is approximately $40,000/boiler. Therefore, the approximate cost factor for the application of low NO_x burner control to reduce NO_x emissions from the proposed boiler is approximately $1700

per ton of NO_x reduced.

Combination FGR and Low NO_x Burner Control

If the FGR system is applied to reduce NO_x emissions, the system is normally used in combination with specifically designed low NO_x burners capable of sustaining a stable flame with the increased inert gas flow resulting from the use of FGR. When low NO_x burners are used in combination with FGR, these techniques are capable of reducing NO_x emissions by 60-90 percent.

No Add-On Control

Facility-wide potential NO_x emissions from the RML facility, including the proposed natural gas-fired boiler, are limited by permit to a natural gas consumption rate of 847 MMcuft during any rolling 12-month time period. Therefore, given other imperative natural gas uses, on a facility wide basis, the proposed boiler may be limited in the amount of natural gas available for consumption. Subsequently, the level of potential NO_x emissions from the proposed boiler may be limited by the permitted allowable amount of natural gas available for combustion in the proposed boiler processes without the application of add-on controls.

Natural Gas Fired Boiler NO_x BACT Summary and Determination

Because the RML facility is limited, by permit, to facility-wide natural gas combustion of 847 MMcuft during any rolling 12-month time period and because the proposed boiler NO_x emissions are relatively low due to the inherent nature of natural gas combustion, the Department determined that no additional control constitutes BACT in this case.

2. CO BACT Analysis

This BACT analysis considers the use of catalytic and thermal oxidizers and good combustion practices utilizing only natural gas for the control of CO emissions from the proposed 64.5 MMBtu/hr boiler. Oxidation of CO in post combustion gases may be accomplished through thermal oxidation with or without the assistance of a catalyst. The efficiency of these CO control technologies is typically near 80%.

Oxidation of Post-Combustion Gases

Incineration is an oxidation process that ideally breaks down the molecular structure of an organic compound into carbon dioxide and water vapor.

Temperature, residence time, and turbulence of the system affect CO control efficiency. A thermal oxidizer/incinerator generally operates at temperatures between 1450°F and 1600°F. Catalytic oxidation/incineration is similar to thermal oxidation/incineration; however, catalytic incineration allows for oxidation at temperatures ranging from 600°F to 1000°F. The catalyst systems that are used are typically metal oxides such as nickel oxide, copper oxide, manganese dioxide, or chromium oxide. Noble metals such as platinum and palladium may also be used. Due to the high temperatures required for complete destruction, fuel costs can be expensive and fuel consumption can be excessive with oxidation units. To lower fuel usage, regenerative thermal oxidizers (RTOs) or regenerative catalytic oxidizers (RCOs) can be used to preheat exhaust gases.

As previously described, oxidation of post-combustion gases invokes various technical problems including the need for high combustion temperatures and subsequent increased fuel use. The use of RTOs and/or RCOs can decrease fuel use needs. However, the cost effectiveness of using RTO or RCO was determined to be approximately $18,000 to $40,000/ton of CO reduction and $18,000 to $21,000/ton of CO reduction, respectively, making oxidation of post-combustion gases economically infeasible. Therefore, the Department determined that oxidation of post-combustion gases will not constitute BACT in this case.

Proper Design and Combustion

In an ideal combustion process, all of the carbon and hydrogen contained within the fuel are oxidized to carbon dioxide (CO_2) and water (H_2O). The emission of CO in a combustion process is the result of incomplete organic fuel combustion.

Some fuels inherently reduce CO emissions due to physical characteristics. Natural gas generally results in much lower CO emissions as compared to various liquid or solid fuels in wide use. RML has proposed the burning of only natural gas in the process heaters for the proposed project with number 2 fuel oil used for back-up purposes only.

Also, reduction of CO can be accomplished by controlling the combustion temperature, residence time, and available oxygen. Normal combustion practice at the RML facility will involve maximizing the heating efficiency of the fuel in an effort to minimize fuel usage. This efficiency of fuel combustion will also minimize CO formation.

RML has proposed the burning of natural gas with number 2 fuel-oil for back-up purposes only and using proper design and combustion practices to control CO emissions from the proposed boiler. Because these methodologies are capable of achieving significant CO reductions and have been utilized by many similar sources in the industry as a means of CO control, the Department considers the use of natural gas and proper design and combustion practices to be BACT for the control of CO resulting from the proposed boiler.

Natural Gas Fired Boiler CO BACT Summary and Determination

In summary, the Department analyzed the use of proper design and combustion and oxidation of post-combustion gases as possible CO control strategies for the proposed boiler. Due to various technical and economic feasibility factors, as previously discussed, the Department determined that proper design and combustion practices will constitute BACT for the control of CO emissions in this case.

3. PM/PM_{10} BACT Analysis

PM and PM_{10} are formed during the combustion of fossil fuels in the proposed boiler. The concentration of PM and PM_{10} can be reduced by using various control technologies including electrostatic precipitators (ESPs), fabric filter baghouses, and wet scrubbers.

ESPs

An ESP is a particle control device that uses electric forces to move particles out of the gas stream and onto collector plates. The particles are given an electric charge by forcing them to through a corona that surrounds a highly charged electrode, frequently a wire. The electrical field then forces the charged particles to the opposite charged electrode,

usually a plate. Solid particles arre removed from the collecting plate by a shaking process known as “rapping”.

ESPs are employed when collection efficiencies of greater than 90 percent are required. ESPs are often used downstream of mechanical collector pre-cleaners that remove the larger size particulate matter. Collection efficiencies of 90 to 99 percent for PM/PM_{10} have been observed for ESPs.

While the use of an ESP is technically feasible for the control of PM/PM_{10} emissions resulting from operation of the proposed boiler, because the burning of natural gas results in relatively low PM/PM_{10} emissions and because the proposed strategy is capable of significant PM/PM_{10} reduction as compared to other solid, liquid, or gaseous fuels the use of an ESP will not constitute BACT in this case.

Wet Scrubbers

Wet scrubbers typically use water to impact, intercept, or diffuse a particle-laden gas stream. With impaction, particle matter is accelerated and impacted onto a surface area or into a liquid droplet through devices such as venturis and/or spray chambers. When using interception, particles flow nearly parallel to the water droplets, allowing the water to intercept the particles. This strategy works most effectively for sub-micron particles. Spray augmented scrubbers and high-energy venturis employ this mechanism. Diffusion is used for particles of 0.5 micron (μm) or smaller and in situations where there is a large temperature difference between the gas and the scrubbing media. The particles migrate through the spray along lines of irregular gas density and turbulence, contacting droplets of approximately equal energy.

Six particle scrubber designs are used in control application such as that proposed: spray, wet dynamic, cyclonic spray, impactor, venturi, and augmented. In all of these scrubbing technologies impaction is the mechanism for collecting particles larger than 3 microns (μm). Since smaller sized particles respond to non-inertial forces, a high density of small droplets is needed to effectively trap these particles. This is accomplished at the price of high-energy consumption due to hydraulic and velocity pressure losses.

The most widely used wet scrubbers are venturi scrubbers. With gas-side pressure drops exceeding 15 inches of water, particulate collection efficiencies of 85 percent or greater have been reported.

While the use of a wet scrubber is technically feasible for the control of PM/PM_{10} emissions resulting from operation of the proposed boiler, because the burning of natural gas results in relatively low PM/PM_{10} emissions and because the proposed strategy is capable of significant PM/PM_{10} reduction as compared to other solid, liquid, or gaseous fuels, the use of an ESP will not constitute BACT in this case.

Fabric Filter Baghouses

Baghouses consist of one or more isolated compartments containing rows of fabric filter bags or tubes. Gas flows pass through the fabric where the particle is retained on the upstream face of the bags, while the cleaned gas stream is vented to the atmosphere or onto another control device. Baghouses are effective for the control of particles from sub-micron to several hundred microns at gas temperatures up to about 500ºF.

Fabric filters can be characterized by the types of cleaning devices (shaker, reverse-air,

and pulse-jet), direction of gas flow, location of the system fan, and the gas-flow quantity. Typically the type of cleaning method distinguishes the fabric filter.

Advantages to baghouses are the high collection efficiencies (in excess of 99%) and the collection of a wide range of particle sizes. The disadvantages include the narrow temperature window of up to approximately 500 to 550ºF (for typical installations), high pressure drops, and problems with gas streams that are corrosive or sticky.

While the use of a fabric filter baghouse is technically feasible for the control of PM/PM_{10} emissions resulting from operation of the proposed boiler, because the burning of natural gas results in relatively low PM/PM_{10} emissions and because the proposed strategy is capable of significant PM/PM_{10} reduction as compared to other solid, liquid, or gaseous fuels, the use of fabric filter baghouse control will not constitute BACT in this case.

Natural Gas Fired Boiler PM/PM_{10} BACT Summary and Determination

In summary, the Department analyzed the use of ESPs, wet scrubbers, and fabric filter baghouses as possible PM/PM_{10} control strategies for the proposed natural gas fired boiler. All of the previously mentioned control strategies are technically feasible and capable of significant PM/PM_{10} emission reductions. However, since the proposed boiler will fire natural gas and number 2 fuel-oil for back-up purposes only and because the firing of natural gas is capable of achieving significant PM/PM_{10} reductions, as compared to other solid, liquid, or gaseous fuels, and this strategy is commonly used for sources of this type, the Department determined that no additional control will constitute BACT for PM/PM_{10} in this case.

4. VOC, SO_2, and Lead (Pb) BACT Analysis

Based on the small amount of VOC, SO_2, and Pb emissions (1.55, 0.17, and 0.0001 tons per year, respectively) associated with the proposed boiler, and the cost of reducing these pollutants, the Department determined that the installation and operation of add-on controls for these pollutants would be cost prohibitive. Therefore, the Department determined that no additional control is BACT for these pollutant emissions in this case.

B. Diesel Emergency Generator BACT Analysis

1. NO_x BACT Analysis

Various NO_x control technologies exist to reduce NO_x emissions from the operation of diesel-fired generators. As with the previous NO_x BACT analysis for the proposed natural gas fired boiler, NO_x formation resulting from the operation of a diesel engine occurs through three fundamentally different mechanisms including thermal NO_x, prompt NO_x, and fuel NO_x (see Section III.A.1 of this permit analysis for a detailed description of these NO_x formation mechanisms).

The Department analyzed various combustion modification techniques, selective catalytic reduction (SCR), non-selective catalytic reduction (NSCR), and proper design, maintenance, and combustion for the control of NO_x emissions from the operation of the proposed emergency/back-up status diesel fired generators.

Combustion Modification

Several combustion modification strategies are available for controlling NO_x emissions from reciprocating engines. Air-to-fuel ratio adjustment, low emission combustion, and pre-stratified charge all function by modifying the combustion zone air-to-fuel ratio, thus influencing O_2 availability and peak flame temperature by delaying the onset of combustion. Combustion modifications, as described above, are not applicable to or are ineffective when used to reduce NO_x emissions from the operation of diesel compression-ignition engines. Therefore, the Department eliminated combustion modification as a viable BACT alternative.

SCR

SCR is a post-combustion gas treatment technique for the catalytic reduction of NO and NO_2 to molecular nitrogen, water, and O_2 in the engine exhaust stream. In the SCR process, NH_3 or urea (the most commonly used reducing agents), is injected into the exhaust gas upstream of a catalyst bed. NO_x and NH_3 form ammonium salts at the catalysts that subsequently decompose to produce elemental nitrogen and water. The catalyst lowers the temperature required for the chemical reaction between NO_x and NH_3. Commonly, the catalyst is a mixture of titanium and vanadium oxides, zeolite, or precious metals. Technical factors that impact the effectiveness of SCR technology include the catalyst reactor design, operating temperature, type of fuel fired, sulfur content of the fuel, design of the NH_3 injection system, and the potential for catalyst poisoning. Removal efficiencies range from 50-90%. Technical feasibility is questionable for application of SCR for the proposed sources; however, it was examined in the BACT analysis.

Because the proposed diesel generators are permitted under emergency/back-up status (i.e. allowable operation < 500 hours/year), the emissions associated with the operation of these units are insignificant (see Section IV, Emission Inventory, of this permit analysis); therefore, the installation and operation of SCR would be economically infeasible for these units. Also, SCR has potentially adverse environmental impacts and additional energy impacts.

Non-Selective Catalytic Reduction (NSCR)

NSCR uses a three-way catalyst to promote the decomposition of NO_x to nitrogen and water. Exhaust CO and hydrocarbons are simultaneously oxidized to carbon dioxide (CO_2) and water in this process. NSCR requires low excess oxygen for the catalyst to function. NSCR is only applicable to fuel-rich burning engines, and diesel fueled engines cannot be operated fuel-rich. For this reason, NSCR has not been applied to any stationary, internal combustion, reciprocating diesel engines. Therefore, because NSCR is technically infeasible for the proposed diesel engines, the Department eliminated NSCR from further review in this BACT analysis.

Proper Design, Maintenance, and Combustion

Reduction of NO_x can be accomplished by controlling the combustion temperature, residence time, and available oxygen. Normal combustion practice at RML involves maximizing the heating efficiency of the fuel in an effort to minimize fuel usage. The efficiency of fuel combustion also minimizes NO_x formation.

Because RML is proposing to utilize the proposed diesel fired generators for emergency/back-up operation only, the installation and operation of add-on controls is cost prohibitive. The Department determined that proper design, maintenance, and combustion will constitute BACT in this case.

NO_x BACT Summary and Determination

For NO_x, the addition of SCR to the proposed emergency diesel fired generators would be cost prohibitive due to the extremely low NO_x emissions associated with emergency/back-up operations. Therefore, good operational practices (proper design, maintenance, and combustion) will constitute BACT for NO_x in this case.

2. CO BACT Analysis

This BACT analysis considers the use of catalytic and thermal oxidizers and good combustion practices for the control of CO emissions from the proposed emergency/back-up status diesel fired generators. Oxidation of CO in post combustion gases may be accomplished through thermal oxidation with or without the assistance of a catalyst. The efficiency of these CO control technologies is typically near 80%.

Oxidation

Oxidation controls ideally break down the molecular structure of an organic compound into CO_2 and water vapor. Temperature, residence time, and turbulence of the system affect CO control efficiency. Incinerators or oxidizers have the potential for very high CO control efficiency; however, this efficiency comes at the expense of increasing NO_x production. A thermal incinerator operates at temperatures between 1450 and 1600 °F. Catalytic incineration is similar to thermal incineration; however, catalytic incineration allows for oxidation at temperatures ranging from 600 to 1000 °F. The catalyst systems that are used are typically metal oxides such as nickel oxide, copper oxide, manganese oxide, or chromium oxide. Due to the high temperatures required for complete destruction, fuel costs can be expensive and fuel consumption can be excessive with oxidation units. To lower fuel usage, like the previously discussed NO_x control strategies, RTOs or RCOs can be used to preheat contaminated process air in a heat recovery chamber.

Because the proposed diesel generators are permitted under emergency/back-up status (i.e. allowable operation < 500 hours/year), the emissions associated with the operation of these units are insignificant (see Section IV, Emission Inventory, of this permit analysis); therefore, the installation and operation of oxidation controls would be economically infeasible for these units. Also, operation of oxidation/incineration controls may come at the expense of increasing NO_x emissions.

Proper Design, Maintenance, and Combustion

Reduction of CO can be accomplished by controlling the combustion temperature, residence time, and available oxygen. Normal combustion practice at RML involves maximizing the heating efficiency of the fuel in an effort to minimize fuel usage. The efficiency of fuel combustion also minimizes CO formation.

Because RML is proposing to utilize the proposed diesel fired generators for emergency/back-up operation only, thus minimizing potential CO emissions through limited operation, the installation and operation of add-on controls would be cost prohibitive. Therefore, the Department determined that proper design, maintenance, and

combustion will constitute BACT in this case.

CO BACT Summary and Determination

For CO, the addition of oxidation/incineration controls to the proposed emergency/back-up diesel fired generators would be cost prohibitive due to the extremely low CO emissions associated with their permitted operation under emergency/back-up status. Therefore, good operational practices (proper design, maintenance, and combustion) will constitute BACT for CO in this case.

3. PM_{10}, VOC, SO_2, and Lead BACT Analysis

Based on the small amount of PM_{10}, VOC, SO_2, and Pb (negligible) emissions associated with the proposed emergency/back-up status diesel fired generators (see Section IV, Emission Inventory, of this permit analysis for PM_{10}, VOC, SO_2 emission estimates), and the cost of reducing these pollutants, the Department determined that the installation and operation of add-on controls for these pollutants would be cost prohibitive. The Department determined that no additional control constitutes BACT for these pollutant emissions in this case.

C. 10,000 Gallon Number 2 Fuel-Oil FST BACT Analysis

The 10,000-gallon number 2 fuel-oil FST has negligible emissions of all pollutants. Therefore, the installation and operation of any add-on controls would be cost prohibitive so the Department did not conduct a detailed BACT analysis for this source. The Department determined that no additional control constitutes BACT for all pollutant emissions in this case.

D. Laboratory Fume Hood BACT Analysis

The laboratory fume hoods have negligible emissions of all pollutants. Therefore, the installation and operation of any add-on controls would be cost prohibitive so the Department did not conduct a detailed BACT analysis for this source. The Department determined that no additional control constitutes BACT for all pollutant emissions in this case.

The control options selected have controls and control costs comparable to other recently permitted similar sources and are capable of achieving the appropriate emission standards.

IV. Emission Inventory

	tons/year					
Emission Source	**PM**	**PM_{10}**	**NOx**	**VOC**	**CO**	**SOx**
Consumat Incinerators (2)	8.76	6.48	3.29	10.95	3.23	0.00
Natural Gas Consumption (6 boilers/2 Incinerators)	3.22	3.22	42.35	2.33	35.57	0.25
Emergency Diesel Generator #1 (2000 kW)	0.47	0.47	16.09	0.47	3.69	5.42
Emergency Diesel Generator #2 (1500 kW)	0.35	0.35	12.07	0.35	2.77	4.07
Emergency Diesel Generator #3 (1250 kW)	0.29	0.29	10.06	0.30	2.30	3.39
Emergency Diesel Generator #4 (1250 kW)	0.29	0.29	10.06	0.30	2.30	3.39
Emergency Diesel Generator #5 (600 kW)	0.14	0.14	4.83	0.14	1.11	1.63
Emergency Diesel Generator #6 (400 kW)	0.30	0.30	4.16	0.33	0.90	0.27
Emergency Diesel Generator #7 (300 kW)	0.22	0.22	3.12	0.25	0.67	0.21

Total Emissions	**14.04**	**11.76**	**106.03**	**15.42**	**52.54**	**18.64**

Consumat Incinerators (2)

Operating Hours: 8760 hr/yr
Maximum Charge Rate: 500 lb/hr (Permit Limit) or 2190 ton/yr
Operating Limit: 1 incinerator at any given time (Permit Limit)

PM Emissions

Emission Factor: 8 lb/ton (AFSSCC 5-01-005-05)
Calculations: 8 lb/ton * 2190 ton/yr * 0.0005 ton/lb = 8.76 ton/yr

PM_{10} Emissions

Emission Factor: 5.92 lb/ton (AFSSCC 5-01-005-05)
Calculations: 5.92 lb/ton * 2190 ton/yr * 0.0005 ton/lb = 6.48 ton/yr

NOx Emissions

Emission Factor: 3.00 lb/ton (AFSSCC 5-01-005-05)
Calculations: 3.00 lb/ton * 2190 ton/yr * 0.0005 ton/lb = 3.29 ton/yr

VOC Emissions

Emission Factor: 10.00 lb/ton (AFSSCC 5-01-005-05)
Calculations: 10.00 lb/ton * 2190 ton/yr * 0.0005 ton/lb = 10.95 ton/yr

CO Emissions

Emission Factor: 2.95 lb/ton (AFSSCC 5-01-005-05)
Calculations: 2.95 lb/ton * 2190 ton/yr * 0.0005 ton/lb = 3.23 ton/yr

SOx Emissions

Emission Factor: 0.00 lb/ton (AFSSCC 5-01-005-05)
Calculations: 0.00 lb/ton * 2190 ton/yr * 0.0005 ton/lb = 0.00 ton/yr

Natural Gas Consumption (6 Boilers/2 Incinerators)

Maximum Consumption: 847 MMcuft/yr (Permit Limit)

PM Emissions

Emission Factor: 7.60 lb/MMcuft (AP-42, Table 1.4-2, 07/98)
Calculations: 7.60 lb/MMcuft * 847 MMcuft/yr * 0.0005 ton/lb = 1.27 ton/yr

PM_{10} Emissions

Emission Factor: 7.60 lb/MMcuft (AP-42, Table 1.4-2, 07/98)
Calculations: 7.60 lb/MMcuft * 847 MMcuft/yr * 0.0005 ton/lb = 1.27 ton/yr

NOx Emissions

Emission Factor: 100 lb/MMcuft (AP-42, Table 1.4-1, 07/98)

Calculations: 100 lb/MMcuft * 847 MMcuft/yr * 0.0005 ton/lb = 42.35 ton/yr

VOC Emissions

Emission Factor: 5.50 lb/MMcuft (AP-42, Table 1.4-2, 07/98)
Calculations: 5.50 lb/MMcuft * 847 MMcuft/yr * 0.0005 ton/lb = 2.24 ton/yr

CO Emissions

Emission Factor: 84 lb/MMcuft (AP-42, Table 1.4-2, 07/98)
Calculations: 84 lb/MMcuft * 847 MMcuft/yr * 0.0005 ton/lb = 8.47 ton/yr

SOx Emissions

Emission Factor: 0.60 lb/MMcuft (AP-42, Table 1.4-2, 07/98)
Calculations: 0.60 lb/MMcuft * 847 MMcuft/yr * 0.0005 ton/lb = 0.25 ton/yr

Emergency Diesel Generator #1 (2000 kW)

Conversion: 2000 kW * 1.341 Hp/kW = 2682.0 Hp
Hours of Operation: 500 hr/yr (Permit Limit)

PM Emissions

Emission Factor: 0.0.0007 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 2682.0 Hp * 0.0007 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.47 ton/yr

PM_{10} Emissions

Emission Factor: 0.0.0007 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 2682.0 Hp * 0.0007 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.47 ton/yr

NOx Emissions

Emission Factor: 0.0240 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 2682.0 Hp * 0.0240 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 16.09 ton/yr

VOC Emissions

Emission Factor: 000705 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 2682.0 Hp * 0.000705 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.47 ton/yr

CO Emissions

Emission Factor: 0.00550 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 2682.0 Hp * 0.00550 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 3.69 ton/yr

SOx Emissions

Emission Factor: 0.00809 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 2682.0 Hp * 0.00809 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 5.42 ton/yr

Emergency Diesel Generator #2 (1500 kW)

Conversion: 1500 kW * 1.341 Hp/kW = 2011.5 Hp
Hours of Operation: 500 hr/yr (Permit Limit)

PM Emissions

Emission Factor: 0.0007 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 2011.5 Hp * 0.0007 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.35 ton/yr

PM_{10} Emissions

Emission Factor: 0.0007 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 2011.5 Hp * 0.0007 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.35 ton/yr

NOx Emissions

Emission Factor: 0.0240 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 2011.5 Hp * 0.0240 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 12.07 ton/yr

VOC Emissions

Emission Factor: 0.000705 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 2011.5 Hp * 0.000705 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.35 ton/yr

CO Emissions

Emission Factor: 0.00550 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 2011.5 Hp * 0.00550 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 2.77 ton/yr

SOx Emissions

Emission Factor: 0.00809 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 2011.5 Hp * 0.00809 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 4.07 ton/yr

Emergency Diesel Generator #3 (1250 kW)

Conversion: 1250 kW * 1.341 Hp/kW = 1676.3 Hp
Hours of Operation: 500 hr/yr (Permit Limit)

PM Emissions

Emission Factor: 0.0007 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 1676.3 Hp * 0.0007 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.29 ton/yr

PM_{10} Emissions

Emission Factor: 0.0007 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 1676.3 Hp * 0.0007 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.29 ton/yr

NOx Emissions

Emission Factor: 0.0240 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 1676.3 Hp * 0.0240 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 10.06 ton/yr

VOC Emissions

Emission Factor: 0.000705 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 1676.3 Hp * 0.000705 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.30 ton/yr

CO Emissions

Emission Factor: 0.00550 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 1676.3 Hp * 0.00550 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 2.30 ton/yr

SOx Emissions

Emission Factor: 0.0.00809 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 1676.3 Hp * 0.00205 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 3.39 ton/yr

Emergency Diesel Generator #4 (1250 kW)

Conversion: 1250 kW * 1.341 Hp/kW = 1676.3 Hp
Hours of Operation: 500 hr/yr (Permit Limit)

PM Emissions

Emission Factor: 0.0007 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 1676.3 Hp * 0.0007 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.29 ton/yr

PM_{10} Emissions

Emission Factor: 0.0007 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 1676.3 Hp * 0.0007 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.29 ton/yr

NOx Emissions

Emission Factor: 0.0240 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 1676.3 Hp * 0.0240 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 10.06 ton/yr

VOC Emissions

Emission Factor: 0.000705 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 1676.3 Hp * 0.000705 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.30 ton/yr

CO Emissions

Emission Factor: 0.00550 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 1676.3 Hp * 0.00550 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 2.30 ton/yr

SOx Emissions

Emission Factor: 0.0.00809 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 1676.3 Hp * 0.00205 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 3.39 ton/yr

Emergency Diesel Generator #5 (600 kW)

Conversion: 600 kW * 1.341 Hp/kW = 804.6 Hp
Hours of Operation: 500 hr/yr (Permit Limit)

PM Emissions

Emission Factor: 0.0007 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 804.6 Hp * 0.0007 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.14 ton/yr

PM_{10} Emissions

Emission Factor: 0.0007 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 804.6 Hp * 0.0007 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.14 ton/yr

NOx Emissions

Emission Factor: 0.0240 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 804.6 Hp * 0.0240 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 4.83 ton/yr

VOC Emissions

Emission Factor: 0.000705 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 804.6 Hp * 0.000705 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb =0.14 ton/yr

CO Emissions

Emission Factor: 0.00550 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 804.6 Hp * 0.00550 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 1.11 ton/yr

SOx Emissions

Emission Factor: 0.00809 lb/Hp-hr (AP-42, Table 3.4-1, 10/96)
Calculation: 804.6 Hp * 0.00809 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 1.63 ton/yr

Emergency Diesel Generator #6 (400 kW)

Conversion: 400 kW * 1.341 Hp/kW = 536.4 Hp
Hours of Operation: 500 hr/yr (Permit Limit)

PM Emissions

Emission Factor: 0.0022 lb/Hp-hr (AP-42, Table 3.3-1, 07/95)
Calculation: 536.4 Hp * 0.0022 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.30 ton/yr

PM_{10} Emissions

Emission Factor: 0.0022 lb/Hp-hr (AP-42, Table 3.3-1, 07/95)
Calculation: 536.4 Hp * 0.0022 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.30 ton/yr

NOx Emissions

Emission Factor: 0.0310 lb/Hp-hr (AP-42, Table 3.3-1, 07/95)
Calculation: 536.4 Hp * 0.0310 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 4.16 ton/yr

VOC Emissions

Emission Factor: 0.00247 lb/Hp-hr (AP-42, Table 3.3-1, 07/95)
Calculation: 536.4 Hp * 0.00247 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.33 ton/yr

CO Emissions

Emission Factor: 0.00668 lb/Hp-hr (AP-42, Table 3.3-1, 07/95)
Calculation: 536.4 Hp * 0.00668 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.90 ton/yr

SOx Emissions

Emission Factor: 0.00205 lb/Hp-hr (AP-42, Table 3.3-1, 07/95)
Calculation: 536.4 Hp * 0.00205 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.27 ton/yr

Emergency Diesel Generator #7 (300 kW)

Conversion: 300 kW * 1.341 Hp/kW = 402.3 Hp
Hours of Operation: 500 hr/yr (Permit Limit)

PM Emissions

Emission Factor: 0.0022 lb/Hp-hr (AP-42, Table 3.3-1, 07/95)
Calculation: 402.3 Hp * 0.0022 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.22 ton/yr

PM_{10} Emissions

Emission Factor: 0.0022 lb/Hp-hr (AP-42, Table 3.3-1, 07/95)
Calculation: 402.3 Hp * 0.0022 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.22 ton/yr

NOx Emissions

Emission Factor: 0.0310 lb/Hp-hr (AP-42, Table 3.3-1, 07/95)
Calculation: 402.3 Hp * 0.0310 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 3.12 ton/yr

VOC Emissions

Emission Factor: 0.00247 lb/Hp-hr (AP-42, Table 3.3-1, 07/95)
Calculation: 402.3 Hp * 0.00247 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.25 ton/yr

CO Emissions

Emission Factor: 0.00668 lb/Hp-hr (AP-42, Table 3.3-1, 07/95)
Calculation: 402.3 Hp * 0.00668 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.67 ton/yr

SOx Emissions

Emission Factor: 0.00205 lb/Hp-hr (AP-42, Table 3.3-1, 07/95)
Calculation: 402.3 Hp * 0.00205 lb/Hp-hr * 500 hr/yr * 0.0005 ton/lb = 0.21 ton/yr

V. Air Quality Impacts

The RML facility is located in an area considered unclassified/attainment for all National and Montana Ambient Air Quality Standards (NAAQS and MAAQS). Under the current permit action, RML proposed the addition of various equipment which will result in an actual and potential increase in emissions of PM, PM_{10}, NO_x, VOC, CO, and SO_x from the permitted facility. Specifically, RML is proposing the addition of one 64.5 MMBtu/hr heat input capacity natural gas-fired boiler, a 2000 kW capacity emergency diesel-fired power generator, a 1250 kW capacity diesel-fired power generator, one 10,000-gallon FST, and various laboratory fume hoods.

In accordance with the Department's "Modeling Requirements and Montana Ambient Air Quality Standards Compliance Demonstration Guidance for Air Quality Preconstruction Permits (Modeling Guidance)," dated October 30, 1998, if a source exceeds any pollutant threshold listed in the Modeling Guidance, air dispersion modeling may be required for the pollutant of concern. The addition of the previously cited equipment to the RML facility brings the facility-wide permitted allowable NO_x emissions to a level greater than the NO_x modeling threshold of 100

tons per year. However, the Modeling Guidance also states that additional modeling will not be required for any existing facility that proposes to increase their allowable emissions unless the cumulative increases in allowable emissions, since the last modeling exercise, exceeds a modeling threshold value. As part of RML's application for Montana Air Quality Permit #2991-01, RML submitted NO_x air dispersion modeling for the project proposed under that permit action.

The NO_x modeling conducted for Permit #2991-01 predicted a maximum annual impact of 0.64528 micrograms per cubic meter ($\mu g/m^3$) and a maximum hourly impact of 46.33628 $\mu g/m^3$. The table below identifies the annual and 1-hour NO_x NAAQS and MAAQS (Federal and Montana Ambient Air Quality Standards, March 24, 1994), the appropriate background concentrations (Background Pollutant Values For Montana Dispersion Modeling, May 19, 1992) and the percentage of the standard used prior to the current permit action.

Standard	Permit #2991-01 Maximum Modeled Impact ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	NO_x NAAQS/MAAQS ($\mu g/m^3$)	Percentage of Standard (NAAQS/MAAQS)
Annual	0.64528	6	99.72/94.08	6.7%/7%
1-Hour	46.33628	75	NA/564	NA/21.5%

As detailed in the table above, prior to the current permit action, the RML facility used approximately 7% of the annual NAAQS/MAAQS and approximately 22% of the 1-hour NAAQS/MAAQS. The total facility change in potential NO_x emissions, since the last NO_x modeling exercise, is an increase of approximately 19 tons per year. Therefore, in accordance with the Department's Modeling Guidance, since potential NO_x emissions added to the facility, since the last modeling exercise, do not exceed the applicable NO_x modeling threshold, modeling was not required for the current permit action. Also, because the NO_x modeling conducted for Permit #2991-01 demonstrates that the facility uses a very low percentage of the annual and 1-hour NO_x NAAQS/MAAQS, the Department determined that the relatively minor increase in potential NO_x emissions associated with the current permit action will not cause or contribute to an exceedance of the NO_x NAAQS/MAAQS. Further, in the view of the Department, the relatively small amount of other regulated pollutant emissions resulting from the proposed project will not cause or contribute to an exceedance of any other applicable NAAQS/MAAQS.

VI. Taking or Damaging Implication Analysis

As required by 2-10-101 through 105, MCA, the Department conducted a private property taking and damaging assessment and determined there are no taking or damaging implications.

VII. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Air and Waste management Bureau
P.O. Box 200901, Helena, Montana 59620
(406) 444-3490

FINAL ENVIRONMENTAL ASSESSMENT (EA)

Issued To: U.S. Department of Health and Human Services
National Institutes of Health
Rocky Mountain Laboratories
903 South 4th Street
Hamilton, MT 59840

Air Quality Permit number: 2991-04

Preliminary Determination Issued: March 6, 2003
Department Decision Issued: March 24, 2003
Permit Final: April 09, 2003

1. *Legal Description of Site*: The legal description of the facility is the NE¼ of Section 36, Township 6 North, Range 21 West, Ravalli County, Montana.

2. *Description of Project*: The current permit action adds one 64.5 MMBtu/hr natural gas fired boiler; two emergency/back-up status power generators of 1250 kW and 2000 kW, respectively; one 10,000-gallon FST for number 2 fuel oil; and various additional laboratory fume hoods.

   Further, in accordance with 40 Code of Federal Regulations (CFR) Part 60, Subpart Ce, RML submitted a permit application for a major source Title V operating permit concurrently with the previously discussed application for changes to the existing preconstruction permit.

   The purpose for permitting the 64.5 MMBtu/hr boiler is in anticipation of the removal of three existing and permitted natural gas-fired boilers of 20 MMBtu/hr heat input capacity, 14.7 MMBtu/hr capacity, and 14.7 MMBtu/hr capacity, respectively. Further, the 1500 kW and 2000 kW diesel generators would be permitted in anticipation of the removal of 2 existing and permitted emergency/back-up status generators of 400 kW and 600 kW, respectively. In addition, the U.S. Department of Health and Human Services, National Institutes of Health, Rocky Mountain Laboratories (RML) would permit the 10,000-gallon number-2 fuel-oil fuel storage tank (FST) in anticipation for the removal of an existing and permitted 2500-gallon number-2 fuel-oil FST. Furthermore, the previously cited equipment would be used, in some capacity, to provide services for the operation of a newly proposed Bio-Level-4 research facility (BL-4 Project) to be located on the RML campus. Due to the inherently dangerous materials (biological pathogens, toxins, etc.) to be studied at the proposed BL-4 facility, the BL-4 Project is currently going through the process of an Environmental Impact Statement (EIS). RML expects that the EIS will be completed in the fall/winter of 2003.

3. *Objectives of Project*: RML is proposing the addition of one 64.5 MMBtu/hr natural gas fired boiler; two emergency/back-up status power generators of 1250 kW and 2000 kW, respectively; one 10,000-gallon FST for number 2 fuel oil; and various additional laboratory fume hoods to replace existing and currently permitted like equipment. Also, the proposed equipment may be used to provide services to the BL-4 Project described in Section 2 of this EA.

4. *Alternatives Considered*: In addition to the proposed action, the Department considered the "no-action" alternative. The "no-action" alternative would deny issuance of the air quality preconstruction permit to the proposed facility. However, the Department does not consider the "no-action" alternative to be appropriate because RML demonstrated compliance with all applicable rules and regulations as required for permit issuance. Therefore, the "no-action" alternative was eliminated from further consideration.

5. *A Listing of Mitigation, Stipulations, and Other Controls*: A list of enforceable conditions, including a BACT analysis, would be included in Permit #2991-04.

6. *Regulatory Effects on Private Property*: The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined that the permit conditions are reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and do not unduly restrict private property rights.

7. *Environmental Impact Statement: BL-4 Project*: This EA addresses potential impacts associated with the construction and operation of the equipment proposed under the current Montana Air Quality Permit action. The scope of the BL-4 project as a whole is out of the scope of this EA and would be addressed in greater detail in the EIS currently in process for the project. However, the EA does consider various aspects of potential impacts associated with the BL-4 Project.

8. The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The "no-action" alternative was discussed in Section 4 of this EA.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Terrestrial and Aquatic Life and Habitats			X			Yes
B	Water Quality, Quantity, and Distribution			X			Yes
C	Geology and Soil Quality, Stability and Moisture			X			Yes
D	Vegetation Cover, Quantity, and Quality			X			Yes
E	Aesthetics				X		Yes
F	Air Quality			X			Yes
G	Unique Endangered, Fragile, or Limited Environmental Resources			X			Yes
H	Demands on Environmental Resource of Water, Air and Energy			X			Yes
I	Historical and Archaeological Sites				X		Yes
J	Cumulative and Secondary Impacts			X			Yes

SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS: The following comments have been prepared by the Department.

A. Terrestrial and Aquatic life and Habitats

The Bitterroot River valley provides habitat for and contains many species of terrestrial wildlife. Large terrestrial species include, but are not limited to, Whitetail and Mule deer, elk, big horn sheep, mountain goats, black bear, mountain lion, and moose. In addition, the Bitterroot valley provides habitat for and contains numerous varieties of smaller mammalian species and many resident and migrant bird species including, but not limited to, raptors, waterfowl, and upland game birds. The Bitterroot Wildlife Management area is located approximately 8 miles northeast of the site.

Further, the Bitterroot River drainage, located approximately ¼ mile east of the RML facility site. The Bitterroot River contains various game-fish species including, but not limited to, two species of special concern (bull trout and westslope cutthroat trout), brook trout, rainbow trout, and brown trout, and numerous non-game-fish species.

Any impacts resulting from the proposed project to terrestrial and aquatic life and habitats would be minor because all required construction activities would take place within the defined RML campus, an existing industrial site. Further, minor impact to the surrounding area from the air emissions (see Section V of the permit analysis) would be realized due to dispersion of pollutants. As previously discussed, terrestrials would use the general area of the facility. However, the area around the campus is fenced to limit access to the facility. The fencing would likely not restrict access from all animals that frequent the area, but may discourage some animals from entering the campus property. Further, because the facility is an existing industrial site, terrestrials that routinely inhabit the area are accustomed to the industrial character of the facility. In addition, because RML is not proposing to directly discharge any material to surface or ground water sources in the area, aquatic life and habitats would realize little or no impact from the proposed facility.

The ambient air quality impact analysis of the air emissions from the proposed project and facility as-a-whole indicates that the air impacts from RML emissions on land or surface water would be minor and would consume only a small portion of the ambient air quality standards as discussed in Section V of the permit analysis (also see Section 8.F of this EA). The small amount of air impact would correspond to an equally small amount of deposition. Overall, any impact to terrestrial and aquatic life and habits from the proposed project would be minor.

B. Water Quality, Quantity and Distribution

The proposed project would not result in any impacts to water quantity or distribution in the area of operation because none of the proposed new equipment would require additional water for proper operation nor would any of the proposed equipment require discharge to any area surface water resource.

Emissions from the proposed project would result in impacts to water quality in the project area. However, as detailed in Section V of the permit analysis (also see Section 8.F of this EA) any emissions and resulting deposition impacts from the project would be minor due to the low concentration of emissions in the discharge and dispersion characteristics of the surrounding area. Overall, any impact to water quality, quantity, and distribution in the proposed area would be minor.

C. Geology and Soil Quality, Stability and Moisture

The impacts to the geology and soil quality, stability, and moisture from this facility would be minor because the project would only require the construction of one additional new building (Building 28), which would occupy a relatively small portion of land directly north of the existing Building 25 structure. A copy of the facility site plan indicating structure locations is available from the Department, upon request. Soil stability in the immediate vicinity of the proposed facility would likely be impacted by the new footings and foundations required for the new building. However, because the proposed construction would take place within an existing industrial site (approximate 33 acre RML campus) it is unlikely that any new facility construction activities would impact soil quality, stability, and moisture.

Some of the air emissions from the facility may deposit on local soils; however, air emissions deposition would result in only a minor impact to local areas because of the relatively low level of pollutant emissions and dispersion characteristics of the area, as discussed in Section V of the permit analysis (also see Section 8.F of this EA). Overall, any impacts to the existing geology and soil quality, stability, and moisture of the area would be minor.

D. Vegetation Cover, Quantity, and Quality

Emissions from the proposed project would impact vegetation cover, quantity, and quality in the proposed project area because operation of the proposed equipment would result in increased emissions from the facility. However, as detailed in Section V (also see Section 8.F of this EA) of the permit analysis any emissions and resulting impacts from the project would be minor because of the relatively low level of pollutant emissions and dispersion characteristics of the area.

Further, the proposed action would require only a minor amount of new construction and ground disturbance (Building 28), which would take place within the existing RML campus. Overall, any impact to the vegetation cover, quantity, and quality of the proposed project area would be minor.

E. Aesthetics

The proposed facility would include the installation and operation of a boiler, incorporating a 50-foot stack that would be visible from various locations in the area. However, because the proposed area of construction is located in a previously disturbed industrial location surrounded by the remainder of the RML campus, any aesthetic impacts would be minor and consistent with current land use in the area.

The facility would be visible from MT Highway 93 (approximately ¼ mile to the east), residential homes surrounding the RML campus, and may be visible from the Bitterroot River (approximately ¼ mile to the east). In addition, steam plumes may be visible from the proposed boiler stack on those days with temperatures low enough to cause steam plumes to form. However, emission controls would be required in Permit #2991-04 to minimize gaseous emissions and opacity would be limited to 20% or less.

Further, the proposed project would result in additional noise in the area. The noise impacts from this facility on the surrounding area would be minor because the proposed equipment would be housed in buildings located within the property boundary thus minimizing potential noise impacts due to the distance between the facility and the surrounding residences. In addition, any noise impacts would be consistent with similar noise impacts currently in place at the RML facility.

It is not expected that the area would receive any appreciable increase in vehicle use and travel. The facility would be located very near to an existing truck route (MT Highway 93) and to other industrial facilities that currently use the route. Vehicles would likely use the existing roads in the area en route to the roads established as part of the actual facility. Visible emissions from access roads (whether the county's responsibility or RML's responsibility) would be limited to 20% opacity.

Overall, any aesthetic impact from the proposed project would be minor and similar to existing impacts resulting from RML operations.

F. Air Quality

The RML facility is located in an area considered unclassified/attainment for all National and Montana Ambient Air Quality Standards (NAAQS and MAAQS). Under the current permit action, RML proposed the addition of various equipment that would result in an actual and potential increase in emissions of PM, PM_{10}, NO_x, VOC, CO, and SO_x from the permitted facility. The air quality impacts from the proposed project would be minor. Permit #2991-04 would include conditions limiting emissions of these pollutants from the various emitting units proposed under the current permit action, as applicable. Further, non-fugitive sources at the facility would be limited by permit to criteria pollutant emissions of 250 tons per pollutant or less during any rolling 12-month time period.

In addition, as described in Section V of the permit analysis to this permit (Air Quality Impacts), computer NO_x (the only pollutant for which RML is considered a major source) air dispersion modeling was conducted prior to the current permit action (Permit #2991-01) to demonstrate compliance with the MAAQS/NAAQS. Prior to the current permit action, the RML facility used approximately 7% of the annual NO_x NAAQS/MAAQS and approximately 22% of the 1-hour NO_x NAAQS/MAAQS. The total facility change in potential NO_x emissions, since the last NO_x modeling demonstration, is an increase of approximately 19 tons per year. Therefore, in accordance with the Department's "Modeling Requirements and Montana Ambient Air Quality Standards Compliance Demonstration Guidance for Air Quality

Preconstruction Permits (Modeling Guidance)," modeling would not be required for the current permit action because potential NO_x emissions added to the facility, since the last modeling exercise, do not exceed the applicable NO_x modeling threshold. Also, because the NO_x modeling conducted for Permit #2991-01 demonstrated that the facility uses a very low percentage of the annual and 1-hour NO_x NAAQS/MAAQS and the current change is relatively minor, the Department determined that the relatively minor increase in potential NO_x emissions from the current project would not cause or contribute to an exceedance of the NO_x NAAQS/MAAQS. Further, in the view of the Department, the relatively small amount of other regulated pollutant emissions resulting from the proposed project would not cause or contribute to an exceedance of any other applicable NAAQS/MAAQS. Overall, any impacts to air quality from the proposed project would be minor.

G. Unique Endangered, Fragile, or Limited Environmental Resources

Emissions from the proposed project would impact unique, endangered, fragile, or limited environmental resources located in the proposed project area because operation of the proposed equipment would result in increased emissions from the facility. However, as detailed in Section V of the permit analysis (see also Section 8.F of this EA), any emissions and resulting impacts from the project would be minor due to the low concentration of those pollutants emitted.

Further, the proposed new equipment would operate within an existing industrial area with only a minor amount of new construction required (Building 28). Also, the proposed project would not change the typical character of the area. Overall, any impact to any existing unique, endangered, fragile, or limited environmental resources in the proposed project area would be minor.

H. Demands on Environmental Resource of Water, Air, and Energy

The proposed project would not result in any increased demand for the environmental resource of water because operation of the proposed equipment would not require additional water use for normal operations. Further, as detailed in Section V of the permit analysis (see also Section 8.F. of this EA), project impacts on air resources in the proposed project area would be minor due to dispersion characteristics of the pollutants emitted and the low concentration of those pollutants emitted. Finally, the proposed new boiler and electric power generators would be "fired" with natural gas and diesel, respectively. Permit #2991-04 would include a limit on the total allowable natural gas consumption facility-wide and a limit on the annual hours of operation of the diesel emergency generators to maintain emergency/back-up status for these units. The conditions limiting fuel consumption and operating hours would decrease the demand for energy from the proposed project. Overall, any demands for environmental resources of water, air, and energy would be minor.

I. Historical and Archaeological Sites

The proposed project would not result in any impact to any existing historical and archaeological sites in the proposed project area because the proposed new equipment would operate within an existing industrial area and would not require any additional construction outside of the property boundary. Also, according to previous correspondence from the Montana State Historic Preservation Office, there is low likelihood of any disturbance to any known archaeological or historic site, given previous industrial disturbance within a given area. Therefore, the proposed project would have little or no chance of impacting any known historic or archaeological site that may be located within or near the proposed operating site.

J. Cumulative and Secondary Impacts

Overall, cumulative and secondary impacts from the proposed project on the physical and biological resources of the human environment in the immediate area would be minor due to the fact that the predominant use of the surrounding area would not change as a result of the proposed project. The Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as would be outlined in Permit #2991-04.

9. The following table summarizes the potential economic and social effects of the proposed project on the human environment. The "no-action" alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Social Structures and Mores				X		Yes
B	Cultural Uniqueness and Diversity				X		Yes
C	Local and State Tax Base and Tax Revenue			X			Yes
D	Agricultural or Industrial Production				X		Yes
E	Human Health			X			Yes
F	Access to and Quality of Recreational and Wilderness Activities				X		Yes
G	Quantity and Distribution of Employment			X			Yes
H	Distribution of Population			X			Yes
I	Demands for Government Services			X			Yes
J	Industrial and Commercial Activity			X			Yes
K	Locally Adopted Environmental Plans and Goals				X		Yes
L	Cumulative and Secondary Impacts			X			Yes

SUMMARY OF COMMENTS ON POTENTIAL ECENOMIC AND SOCIAL EFFECTS: The following comments have been prepared by the Department.

A. Social Structures and Mores
B. Cultural Uniqueness and Diversity

The proposed project would not have any impact on the social structures and mores or the cultural uniqueness and diversity of the proposed area of operation because the project would include adding equipment to the permitted facility to facilitate operations similar to existing operations at the RML facility. The predominant use of the surrounding area would not change as a result of the proposed project.

C. Local and State Tax Base and Tax Revenue

The proposed project would have a minor impact on the local and state tax base and tax revenue because the project may increase current research practices at the facility. However, any economic impact to the area would be minor because the proposed project would not change typical operations at the facility. Further, the project would require only a limited amount of new construction (Building 28) and only a limited number of existing employees/operators and potentially new employees would be required for normal operations of the proposed equipment. Overall, any impact to local and state tax base and tax revenue would be minor as a result of the installation and operation of the proposed new equipment at the facility.

D. Agricultural or Industrial Production

Because the proposed project would operate within the existing RML research facility and the limited amount of additional construction required for the project (Building 28) would occur within the boundaries of the RML campus, the project would not impact or displace any land used for agricultural production. Further, the nature of the project would not result in additional industrial production.

E. Human Health

The Clean Air Act (CAA), which was last amended in 1990, requires EPA to set NAAQS for pollutants considered harmful to public health and the environment. The federal Clean Air Act established two types of NAAQS, Primary and Secondary. Primary Standards are limits set to protect public health, including, but not limited to, the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary Standards are limits set to protect public welfare, including, but not limited to, protection against decreased visibility, damage to animals, crops, vegetation, and buildings. Permit #2991-04 would contain conditions and limitations that would require compliance with all applicable national and state air quality standards, including the federal primary and secondary standards. Therefore, because the proposed project would result in an increase in air pollutants but would require compliance with the NAAQS/MAAQS any impact to human health would be minor.

F. Access to and Quality of Recreational and Wilderness Activities

Because the proposed project would operate within the existing RML campus, the project would not impact any access to or quality of any recreation or wilderness activities in the area.

G. Quantity and Distribution of Employment
H. Distribution of Population

The installation and operation of the proposed new equipment at the RML facility would utilize existing RML personnel for operations and would likely not require any new or only a limited amount of new employment. Therefore, the proposed project would have little or no impact on the quantity and distribution of employment and population in the area.

I. Demands for Government Services

Government services would be required for acquiring the appropriate permits from government agencies. In addition, the permitted source of emissions would be subject to periodic inspections by government personnel. Demands for government services would be minor.

J. Industrial and Commercial Activity

The proposed project would result in only minor impact on local industrial and commercial activity because the proposed project would be similar to existing activity at the RML facility and would operate within the existing RML campus. Further, the proposed project would require only a small amount of new construction (Building 28) and would not result in additional industrial production.

K. Locally Adopted Environmental Plans and Goals

The Department is not aware of any locally adopted environmental plans or goals in the immediate area affected by the proposed project. The state standards would be protective of the proposed project area.

L. Cumulative and Secondary Impacts

Overall, cumulative and secondary impacts from the proposed project on the economic and social resources of the human environment in the immediate area would be minor due to the fact that the predominant use of the surrounding area would not change as a result of the proposed project. The Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as would be outlined in Permit #2991-04.

Recommendation: No EIS is required.

If an EIS is not required, explain why the EA is an appropriate level of analysis: The current permit action is for the addition of one 64.5 MMBtu/hr natural gas fired boiler; two emergency/back-up status power generators of 1250 kW and 2000 kW, respectively; one 10,000-gallon FST for number-2 fuel-oil; and various additional laboratory fume hoods. Permit #2991-04 includes conditions and limitations to ensure the facility would operate in compliance with all applicable rules and regulations. In addition, as detailed in the above EA there are no significant impacts associated with the proposed project.

Other groups or agencies contacted or which may have overlapping jurisdiction: Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program

Individuals or groups contributing to this EA: Department of Environmental Quality – Air and Waste Management Bureau, Montana Historical Society – State Historic Preservation Office.

EA prepared by: M. Eric Merchant, MPH
Date: February 10, 2003